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RADAPPERTIZATION (RADIATION STERILIZATION) OF FOODS

ARMY NATICK LABORATORIES

JUNE 1973

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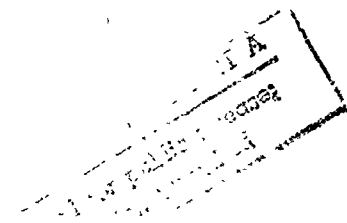
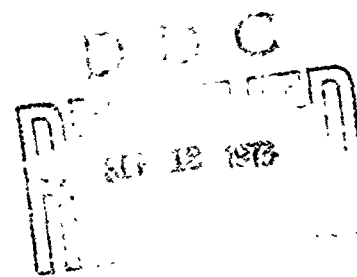
Eugen Wierbicki

Irradiated Food Products Division

June 1973

Food Laboratory
US Army Natick Laboratories
Natick, Massachusetts 01760

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<p>This report is a bibliography of technical publications and papers on radappertized (radiation sterilized) foods written by scientific and supervisory personnel of the U. S. Army Natick Laboratories (NLABS), working in or responsible for the part of the National Radiation Preservation of Food Program dealing with radiation sterilization processing of pre-packaged, shelf-stable foods, mainly red meats, poultry and selected seafoods. The report includes 98 publications published within the period March 1962 through June 1973, subdivided into books, technical reports, patents, technical papers (NLABS) and reprints of scientific and technical journals.</p> <p>Index of authors with the corresponding entry numbers are included for easy search of the publications by the names of the authors.</p>			

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FOREWORD

Numerous requests from the food industry and academic and research institutions in the United States and abroad about the status and progress made in the field of radappertized (radiation sterilized) shelf-stable foods prompted preparation of this bibliography report. This bibliography is a list of technical publications and papers by scientific and supervisory personnel of the U. S. Army Natick Laboratories (NLABS) working in or responsible for the part of the National Radiation Preservation of Food Program dealing with high dose radiation processing of pre-packaged, shelf-stable foods.

In addition, the compilation contains contractors' reports and a few selected books which were either edited or contain papers contributed by the NLABS personnel. In the book section are listed five periodic reviews of the food radiation program by the Joint Committee on Atomic Energy, Congress of the United States, which continuously encourages and supports the food irradiation program under the "Atoms for Peace" program.

The period covered by this bibliography is March 1962 through June 1973. The bibliography, subdivided into 5 groups (see contents), is arranged chronologically by the date of publication. This will allow easy updating of this report in the years ahead.

The books listed can be purchased from the publishers and copies of the patents from the U. S. Patent Office. A limited number of technical reports may be obtained from the Project Officers at the Natick Laboratories. Most of the technical papers and reprints from technical journals are available for distribution as of this time by writing to:

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RADAPPERTIZATION OF FOODS

I. BOOKS

1. REVIEW OF AEC AND ARMY FOOD IRRADIATION PROGRAMS.
Hearings before the Subcommittee on Research, Development and Radiation of the Joint Committee on Atomic Energy, Congress of the United States (JCAE), Eighty-Seventh Congress, Second Sessions, March 6 and 7 1962. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402
Price \$3.00.
2. REVIEW OF THE ARMY FOOD IRRADIATION PROGRAM.
Hearing, JCAE, Eighty-Eighth Congress, First Session, May 13, 1963. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402
Price \$1.50.
3. RADIATION PROCESSING OF FOODS.
Hearings, JCAE, Eighty-Ninth Congress, First Sessions, June 9 and 10, 1965. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402
Price \$2.50.
4. REVIEW OF THE FOOD IRRADIATION PROGRAM.
Hearing, JCAE, Eighty-Ninth Congress, Second Session, September 12, 1966. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402
Price \$1.00.
5. STATUS OF THE FOOD IRRADIATION PROGRAM.
Hearings, JCAE, Ninetieth Congress, Second Sessions, July 18 and 20, 1968. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402
Price \$3.00.
6. THE TECHNICAL BASIS FOR LEGISLATION ON IRRADIATED FOOD.
Report of a Joint FAO/IAEA/WHO Expert Committee, Rome, 21-28 April 1964. FAO, Atomic Energy Series No. 6, Food and Agriculture Organization of the United Nations, Rome 1965.
7. CURRENT STATUS AND COMMERCIAL PROSPECTS FOR RADIATION PRESERVATION OF FOOD.
H. W. Ketchum, J. W. Osburn, Jr. and J. Deitch.
TID-21431, BDSA
U. S. Department of Commerce
Washington, D. C. 20230.
January 1965.
(174 pages, 185 references).

RADAPPERTIZATION OF FOODS

8. RADIATION PRESERVATION OF FOODS.
Proceedings, International Conference, Boston, Massachusetts,
September 27-30, 1964; Publication 1273, National Academy of
Sciences-National Research Council, Washington, D. C. 20418, 1965.
(37 papers, 424 pages)
Price \$9.00
9. FOOD IRRADIATION.
Proceedings, International Symposium on Food Irradiation,
the International Atomic Energy Agency and the Food and Agriculture
Organization of the United Nations, Karlsruhe, Germany, 6-10 June 1966;
STI/PUB/127, International Atomic Energy Agency, P. O. Box 590,
A-1011 Vienna, Austria, 1966.
(67 papers, 956 pages).
Price \$20.00
10. CHEMICAL AND FOOD APPLICATIONS OF RADIATION.
60th National Meeting of the American Institute of Chemical Engineers,
Atlantic City, New Jersey, September 18-21, 1966. Chemical Engineering
Progress Symposium Series, No. 83, Vol. 64, 1968 - American Inst. Chem.
Engineers, 345 E. 47th Street, New York, N. Y. 10017.
(16 papers, 149 pages).
11. RADIATION PRESERVATION OF FOODS.
A Symposium co-sponsored by the Div. of Agricultural and Food Chemistry
and the Division of Nuclear Chemistry and Technology at the 150th Meeting
of the American Chem. Society, Atlantic City, N. J., Sept. 16-17, 1965.
Advances in Chemistry Series 65, American Chem. Soc., Washington, D. C.,
1967 (15 papers, 184 pages).
Price \$7.00
12. THE COMMERCIAL PROSPECTS FOR SELECTED IRRADIATED FOODS.
TID-24058, BDSA
U. S. Department of Commerce,
Washington, D. C. 20230
March 1968
(90 pages, 154 references).
Price \$0.50
13. RADIATION PROCESSING OF FOOD PRODUCTS.
L. V. Metlitskii, V. N. Rogachev and V. G. Krushchev.
Moscow, U.S.S.R. 1967.
ORNL-IIC-14, July 1968
Translated from Original Russian by Oak Ridge National Laboratory,
Oak Ridge, Tennessee, for the U. S. Atomic Energy Commission.
Edited by M. Gerrard, F. E. McKinney, P. S. Baker and E. Wierbicki.
Clearinghouse for Federal Scientific and Technical Information, National
Bureau of Standards, U. S. Department of Commerce, Springfield, Va. 22151
(115 pages, 82 references).
Price \$3.00

RADAPPERTIZATION OF FOODS

14. COST-BENEFITS ANALYSIS.
Potential Radiation Sterilized Military Subsistence Items.
J. Deitch, J. W. Osburn, Jr. and H. W. Ketchum.
U. S. Department of Commerce, Bureau of Domestic Commerce, March 1972.
Superintendent of Documents, U. S. Government Printing Office,
Washington, D. C. 20402.
(150 pages, 66 references).
Price \$1.25
15. RADIATION RESEARCH REVIEWS.
Symposium on the Recent Advances in the Chemistry of Food Irradiation,
161st National Meeting, the American Chemical Society, Division of
Agricultural Chemistry, 1st April 1971, Los Angeles, Cal.
Edited by E. S. Josephson and Charles Merritt, Jr., Vol. 3 (4):
281-460 (completing Vol. 3), July 1972. Elsevier Publishing Company,
P. O. Box 211, Amsterdam, The Netherlands.
(11 papers)

II. TECHNICAL REPORTS

16. FD-3
EXTRACTIVES AND FUNCTIONAL PERFORMANCE OF FLEXIBLE PACKAGING MATERIALS
FOR USE IN RADIATION STERILIZATION OF PREPACKAGED FOODS.
G. O. Payne, Jr. and C. H. Spiegl, December 1964 (Continental Can Company,
Contract No. DA19-129-AMC-162(N); Project Officer, NLABS - J. J. Killoran).
17. FD-6
INDUCED RADIOACTIVITY IN FOOD AND ELECTRON STERILIZATION.
Richard A. Meyer, April 1965 (U. S. Army Natick Laboratories.)
18. OI-452-4472
INVESTIGATION OF THE USE OF VERY HIGH DOSE RATES FOR THE RADIATION
PRESERVATION OF PROTEIN FOOD.
Paul-Ivor E. Hansen, Grete Ellemann and Annette Juel Pedersen,
13 August 1965. (The Danish Meat Research Institute, Contract
No. DA91-591-EUC-3342; Project Officer, NLABS - E. S. Josephson).
19. 69-57-FL
STUDY OF EXTRACTABLE SUBSTANCES AND MICROBIAL PENETRATION OF POLYMERIC
PACKAGING MATERIALS TO DEVELOP FLEXIBLE PLASTIC CONTAINERS FOR RADIATION
STERILIZED FOODS.
G. O. Payne, Jr., C. J. Spiegl and F. E. Long, January 1969 (Continental
Can Company, Contract No. DA19-129-AMC-162(N); Project Officer, NLABS -
J. J. Killoran.)

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20. 69-64-FL.
EFFECT OF LOW TEMPERATURE IRRADIATION ON CHEMICAL AND SENSORY CHARACTERISTICS OF BEEF STEAKS.
F. L. Kauffman and J. W. Harlan, March 1969 (Swift and Company, Contract No. DA19-129-AMC-164(N); Project Officer, NLABS - E. Wierbicki).
21. 69-65-FL.
DEVELOPMENT OF RADIATION-STERILIZED FISH PRODUCTS.
Melvin E. Waters and Mary H. Thompson, April 1969 (U. S. Department of Interior, Bureau of Commercial Fisheries, AD 688123. Project Officer, NLABS - F. Heiligman).
22. 71-44-FL.
EFFECT OF IRRADIATION DOSE AND TEMPERATURE ON THE THIAMINE CONTENT OF HAM.
M. H. Thomas and E. Wierbicki, January 1971. (U. S. Army Natick Laboratories).
23. 71-39-FL
STORAGE STABILITY STUDIES ON RADIATION STERILIZED FISH ITEMS.
R. O. Sinnhuber, March 1971 (Oregon State University, Contract No. DA19-129-AMC-853(N); Project Officer, NLABS - F. Heiligman).
24. 72-31-FL.
DEVELOPMENT OF COOKING PROCEDURES AND RECIPES FOR USING IRRADIATION STERILIZED MEATS.
Agnes F. Carlin. (Iowa State University, Contract No. DA19-129-AMC-227(N); January 1972; Project Officer, NLABS, F. Heiligman.)
25. 72-32-FL
IRRADIATION STUDIES ON MEAT.
J. W. Harland and F. L. Kauffman, January 1972. (Swift and Company, Contract NLABS (Natick) No. 172; Project Officer, NLABS - F. Heiligman).
26. 72-42-FL
DEVELOPMENT OF RADIATION STERILIZED FISH ITEMS.
L. J. Ronsivalli, February 1972. (U. S. Department of Interior, Bureau of Commercial Fisheries, Project Order No. 66-88; Project Officer, NLABS - F. Heiligman).
27. 72-55-FL.
IRRADIATION INDUCED HEADSPACE GASES IN PACKAGED RADIATION STERILIZED FOOD.
George B. Pratt and Lloyd E. Kneeland, February 1972 (American Can Company, Contract No. DA19-129-AMC-119(N); Project Officer, NLABS - F. Heiligman).
28. 73-7-FL.
ACCELERATOR RADIATION PROTECTION.
Thomas G. Martin, III, 1972 (U. S. Army Natick Laboratories).

RADAPPERTIZATION OF FOODS

III. PATENTS

29. PROCESS FOR INACTIVATING ENZYMES IN MEAT TO BE STABILIZED BY IRRADIATION. G. W. Shults and E. Wierbicki, U. S. Army Natick Laboratories; U. S. Patent No. 3,554,773 (January 12, 1971).
30. PROCESS FOR RADIATION STERILIZING A PACKAGED PRECOOKED MEAT AND GRAVY PRODUCT. G. W. Shults, U. S. Army Natick Laboratories; U. S. Patent No. 3,573,067 (March 30, 1971).
31. PROCESS FOR PREPARING STERILIZED COMMINUTED BEEF PRODUCTS. G. W. Shults, U. S. Army Natick Laboratories; U. S. Patent No. 3,592,658 (July 13, 1971).
32. PROCESS FOR STABILIZING STRUCTURE OF GROUND MEAT. G. W. Shults and E. Wierbicki, U. S. Army Natick Laboratories; U. S. Patent No. 3,642,500 (February 10, 1972).
33. METHOD FOR PACKAGING FLEXIBLE PACKAGES IN CYLINDRICAL CONTAINERS. F. Heiligman, U. S. Army Natick Laboratories; U. S. Patent No. 3,645,759 (February 29, 1972).

IV. TECHNICAL PAPERS, NLABS

34. RADIATION STERILIZATION OF FOOD IN THE U.S.A. E. S. Josephson (Eighth Conference on Radioisotopes - Tokyo, Japan, November 13-16, 1967).
35. ADVANTAGES, PROBLEMS AND EXPERIENCES OF IRRADIATED FOODS. E. S. Josephson (Aerospace Food Technology, NASA SP-202; the University of Florida, Tampa, Florida, April 15-17, 1967).
36. NUCLEAR APPLICATIONS IN THE FOOD INDUSTRY. E. S. Josephson (44th Annual Conference of the American Industrial Development Council, Inc., Miami Beach, Florida, May 11-14, 1969).
37. HIGH DOSE RADIATION PROCESSING OF MEAT, POULTRY AND SEAFOOD PRODUCTS. E. Wierbicki, A. Anellis, J. J. Killoran, E. L. Johnson, Miriam H. Thomas and E. S. Josephson (The Third International Congress of Food Science and Technology (SOS/70), Washington, D. C. on August 9-14, 1970).
38. FACTORS INFLUENCING ECONOMIC EVALUATION OF IRRADIATION PROCESSING. Ari Brynjolfsson (Panel on Radiation Processing Techniques of Special Interest to Developing Countries, Seoul, Korea, 28 September - 2 October 1970).

RADAPPERTIZATION OF FOODS

39. THE OBJECTIVES AND PRESENT STATUS OF IRRADIATION OF MEAT AND MEAT PRODUCTS.
Dr. E. S. Josephson (Study Group Meeting on Food Irradiation for the South East and East Asian Countries, Bangkok, Thailand, 13-17 December 1971).
40. DEFINITION AND CONTROL OF PROCESSING PARAMETERS FOR RADAPPERTIZATION OF BEEF FOR WHOLESOMENESS STUDIES IN THE UNITED STATES.
Ari Brynjolfsson (FAO/IAEA International Symposium on Radiation Preservation of Food, Bombay, India, 13-17 November 1972; IAEA/SM-166-40).
41. RADAPPERTIZATION OF MEAT, MEAT PRODUCTS, AND POULTRY.
Edward S. Josephson, Ari Brynjolfsson; Eugen Wierbicki, Durwood B. Rowley, Charles Merritt, Jr., Roger W. Baker, John J. Killoran and Miriam H. Thomas (FAO/IAEA International Symposium on Radiation Preservation of Food, Bombay, India, 13-17 November 1972; IAEA/SM-166/41).

V. REPRINTS

42. DOSIMETRY IN FOOD PRESERVATION BY IONIZING RADIATION.
R. D. Jarrett, Sr. and J. Halliday. Activities Report, Vol. 15, 143-150 (1963).
43. STORAGE STABILITY OF IRRADIATED MEATS.
Fred Heiligman. Food Technology, Vol. 19, 114-116 (1965).
44. PRESERVATION OF MEATS BY STERILIZING DOSES OF IONIZING RADIATION.
Eugen Wierbicki, Morris Simon, and Edward S. Josephson. Radiation Preservation of Foods - Publication 1273, pp 383-409; National Academy of Sciences - National Research Council, Washington, D. C., 1965.
45. PRINCIPLES OF MICROBIOLOGICAL SAFETY AND STABILITY OF RADIATION-STERILIZED FOODS.
Hamed M. El-Bisi. Radiation Preservation of Foods - Publication 1273 pp. 223-232; National Academy of Sciences - National Research Council, Washington, D. C., 1965.
46. AN EVALUATION OF DOSIMETRY PROCEDURES APPLICABLE FOR USE IN FOOD IRRADIATION.
Niels W. Holm, Robert D. Jarrett, Sr., Radiation Preservation of Foods - Publication 1273, pp. 361-382; National Academy of Sciences - National Research Council, Washington, D. C., 1965.
47. EFFECT OF TEMPERATURE OF LIQUID NITROGEN ON RADIATION RESISTANCE OF SPORES OF CLOSTRIDIUM BOTULINUM.
Nicholas Grecz, P. P. Snyder, A. A. Walker, and A. Anellis, Applied Microbiology, Vol. 13 (4): 527 (1965).

RADAPPERTIZATION OF FOODS

48. RADIATION STERILIZATION OF BACON FOR MILITARY FEEDING.
A. Anellis, N. Grecz, D. A. Huber, D. Berkowitz, M. D. Schneider,
and M. Simon. Applied Microbiology, Vol. 13 (1): 37-42 (1965).
49. SURVIVAL OF CLOSTRIDIUM BOTULINUM SPORES.
A. Anellis, Nicholas Grecz and D. Berkowitz. Applied Microbiology,
Vol. 13 (3): 397-401 (1965).
50. ACCEPTANCE OF IRRADIATED FOODS.
F. Heiligman and C. E. Phillips. Activities Report, Vol. 17 (2):
114-119 (1965).
51. LOW TEMPERATURE IRRADIATION OF MEAT.
C. K. Wadsworth and G. W. Shults. Activities Report, Vol. 18 (1):
13-17 (1966).
52. WHOLESOMENESS OF IRRADIATED FOODS.
An Annotated Bibliography. E. F. Reber, Krishan Raheja and Dorothy Davis.
Federation Proceedings, Vol. 25 (5) Part I: 1531-1577 (1966).
53. PACKAGING FOR RADIATION-STERILIZED FOODS: PRESENT STATUS.
Eugen Wierbicki and John J. Killoran. Activities Report, Vol. 18 (1):
18-29 (1966).
54. INCIDENCE OF MESOPHILIC CLOSTRIDIUM SPORES IN RAW PORK, BEEF AND CHICKEN.
IN PROCESSING PLANTS IN THE UNITED STATES AND CANADA.
R. A. Greenberg, R. B. Tompkin, B. O. Bladel, R. S. Kittaka, and A. Anellis.
Applied Microbiology, Vol. 14: 789-793 (1966).
55. IRRADIATION DAMAGE IN LIPIDS.
Charles Merritt, Jr., Pio Angelini, M. L. Bazinet and D. J. McAdoo.
Advances in Chemistry Series, No. 56: 225-240 (1966).
56. VOLATILE COMPOUNDS INDUCED BY IRRADIATION IN BASIC FOOD SUBSTANCES.
Charles Merritt, Jr., Pio Angelini and D. J. McAdoo. Radiation Preservation
of Foods, Advances in Chemistry Series, No. 65: 26-34 (1967).
57. RADIATION DOSIMETRY IN RELATION TO HIGH INTENSITY RADIATION SOURCES.
R. D. Jarrett, Sr. Radiation Preservation of Foods, Advances in
Chemistry Series, No. 65: 78-86 (1967).
58. U. S. ARMY RADIATION LABORATORY.
R. D. Jarrett, Sr., Advances in Chemistry Series, No. 65: 156-170 (1967);
Radiation Preservation of Foods:
59. DEVELOPMENT OF RADIATION-STERILIZED CHICKEN.
F. Heiligman, C. K. Wadsworth and C. E. Phillips. Food Technology,
Vol. 21 (5): 108-110 (1967).

RADAPPERTIZATION OF FOODS

60. RADIATION STERILIZATION OF PROTOTYPE MILITARY FOODS, II. CURED HAM.
Abe Anellis, D. Berkowitz, C. Jarboe and H. M. El-Bisi. Applied Microbiology, Vol. 15 (1): 166-167 (1967).
61. IRRADIATION INDUCED GAS IN PACKAGED FOODS. I. IDENTIFICATION AND MEASUREMENTS.
G. B. Pratt, L. E. Kneeland, F. Heiligman, and J. J. Killoran. Journal of Food Science, Vol. 32 (2): 200-205 (1967).
62. DEVELOPMENT OF FLEXIBLE CONTAINERS FOR IRRADIATED FOODS.
I. SCREENING OF COMMERCIALY AVAILABLE PLASTIC LAMINATES.
John J. Killoran, Jacob D. Breyer and E. Wierbicki. Food Technology, Vol. 21 (8): 73-77 (1967).
63. PACKAGING OF IRRADIATED FOODS.
John J. Killoran. Modern Packaging, Vol. 40 (8): 179 (1967).
64. PACKAGING MATERIALS FOR USE DURING THE IRRADIATION OF PREPACKAGED FOODS.
Federal Register, 121, 2543; p. 309, July 1967.
65. DETOXIFICATION OF SALMONELLA TYPHIMURIUM LIPOPOLYSACCHARIDE BY IONIZING RADIATION. Joseph J. Previte, Y. Chang and H. M. El-Bisi, Journal of Bacteriology, Vol. 93 (5): 1607 (1967).
66. SALMONELLOSIS - THE PROBLEM AND A POTENTIAL REMEDY.
Joseph J. Previte, Activities Report, Vol. 19 (1): 64 (1967).
67. MACHINE IRRADIATION SOURCES AND IRRADIATION TECHNOLOGY.
Ari Brynjolfsson. Chemical and Food Applications of Radiation, Chemical Engineering Progress Symposium Series, Vol. 74, No. 83: 71-86 (1968).
68. STATUS OF THE U. S. ARMY PROGRAM IN FOOD IRRADIATION.
E. S. Josephson and Eugen Wierbicki. Chemical and Food Applications of Radiation, Chemical Engineering Progress Symposium Series, Vol. 64, No. 83: 87-96 (1968).
69. WHOLESOMENESS TESTING OF IRRADIATED FOODS.
N. Raica, Jr., Chemical and Food Applications of Radiation, Chemical Engineering Progress Symposium Series, Vol. 64, No. 83: 66-69 (1968).
70. ENGINEERING AND ECONOMICS OF FOOD IRRADIATION.
E. S. Josephson, Ari Brynjolfsson and Eugen Wierbicki. Transactions, New York Academy of Sciences, Series II, Vol. 30 (4): 600-614 (1968).
71. A SIGNIFICANT CORRECTION FACTOR IN GAMMA RAY DOSIMETRY.
Ari Brynjolfsson. Radiation Chemistry - I, Advances in Chemistry Series No. 81: 550-567 (1968).
72. RADIATION STERILIZATION OF PREFRIED COD AND HALIBUT PATTIES.
R. O. Sinnhuber, Mary K. Landers, T. C. Yu, Morris Simon and Fred Heiligman. Food Technology, Vol. 22 (12): 1570 (1968).

RADAPPERTIZATION OF FOODS

- 73.) ESTIMATION OF RADIATION RESISTENCE VALUES OF MICROORGANISMS IN FOOD PRODUCTS.
Abe Anellis and Stanley Werkowski, Applied Microbiology, Vol. 16 (5): 1300 (1968).
74. PROCESS CRITERIA FOR PRODUCING RADIATION STERILIZED FISH PRODUCTS.
R. J. Learson, L. J. Ronsivalli, B. W. Spracklin and F. Heiligman. Food Technology, Vol. 23 (8): 85-91 (1969).
75. U. S. ARMY FOOD IRRADIATION PROGRAM.
E. Wierbicki, C. K. Wadsworth, A. Brynjolfsson and E. S. Josephson. Food Irradiation (European Information Centre for Food Irradiation, Saclay, France) pp. 33-42, January-March 1970.
76. RADIATION PRESERVATION OF FOODS AND ITS EFFECT ON NUTRIENTS.
Miriam H. Thomas and Edward S. Josephson. The Science Teacher, Vol. 37, No. 3, March 1970.
77. CONDITIONS AFFECTING GERMINATION OF CLOSTRIDIUM BOTULINUM 6A SPORES IN A CHEMICALLY DEFINED MEDIUM.
Durwood B. Rowley and Florence Feeherry. Journal of Bacteriology, Vol. 104, (3): 1151-1157 (1970).
78. A METHOD OF CALCULATING AVERAGE STERILIZING VALUE IN CYLINDRICAL CONTAINERS.
Joseph S. Cohen and Mrs. Mary Ann Wall. Transactions of the ASAE, Vol. 14 (2): 329-333 (1971).
79. ASSAY OF PROTEOLYTIC ENZYME ACTIVITY USING A ¹⁴C-LABELED HEMOGLOBIN.
J. S. Roth, Thomas Losty and Eugen Wierbicki. Analytical Biochemistry, Vol. 42: 214-221 (1971).
- 80: EFFECT OF IRRADIATION TEMPERATURE IN THE RANGE -196 to +95C ON THE RESISTANCE OF SPORES OF CLOSTRIDIUM BOTULINUM 33A IN COOKED BEEF.
N. Grecz, A. A. Walker, Abe Anellis and D. Berkowitz. Canadian Journal of Microbiology, Vol. 17, No. 2: 135-142 (1971).
81. BREMSSTRAHLUNG PRODUCTION AND SHIELDING OF STATIC AND LINEAR ELECTRON ACCELERATORS BELOW 50 MeV. TOXIC GAS PRODUCTION, REQUIRED EXHAUST RATES, AND RADIATION PROTECTION INSTRUMENTATION.
Ari Brynjolfsson and Thomas G. Martin III. International Journal of Applied Radiation and Isotopes, Vol. 22: 29-40 (1971).
82. ESTIMATION OF AN EQUIVALENT "12D" PROCESS BY THE NORMAL DISTRIBUTION METHOD.
Abe Anellis and Stanley Werkowski. Canadian Journal of Microbiology, Vol. 17, No. 9: 1185-1187 (1971).

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83. NUCLEAR PRESERVATION OF FOOD.
Lucy J. Rice. Union Carbide Outlook, Vol. 2, No. 4, December 1971.
84. INACTIVATION OF THIRTY VIRUSES BY GAMMA RADIATION.
Robert Sullivan, Alexander C. Fassolitis, Edward P. Larkin, Ralson B. Read, Jr., and James T. Peeler. Applied Microbiology, Vol. 22 (1): 61-65 (1971).
85. PRODUCTION OF TYPES A AND B SPORES OF CLOSTRIDIUM BOTULINUM BY THE BIPHASIC METHOD: EFFECT ON SPORE POPULATION, RADIATION RESISTANCE, AND TOXIGENICITY.
Abe Anellis, D. Berkowitz, D. Kemper and D. B. Rowley, Applied Microbiology, Vol. 23 (4): 734-739 (1972).
86. DEVELOPMENT OF IRRADIATION STERILIZED CODFISH CAKE.
F. Heiligman and L. J. Rice. Journal of Food Science, Vol. 37 (3): 420-422 (1972).
87. COMPARISON OF PRE-COOKED IRRADIATED CHICKEN AND LAMB WITH AND WITHOUT PARTIAL DEHYDRATION.
S. R. Agarwal, F. Heiligman and E. M. Powers. Journal of Food Science, Vol. 37 (3): 469-472 (1972).
88. RADIATION STERILIZATION OF PROTOTYPE MILITARY FOODS: LOW-TEMPERATURE IRRADIATION OF CODFISH CAKE, CORNED BEEF, AND PORK SAUSAGE.
Abe Anellis, D. Berkowitz, W. Swantak and C. Strojan. Applied Microbiology, Vol. 24 (3): 453-462 (1972).
89. EFFECT OF CONDENSED PHOSPHATES ON pH, SWELLING AND WATER-HOLDING CAPACITY OF BEEF.
G. W. Shults, D. R. Russell and E. Wierbicki. J. Food Science, Vol. 37 (6): 860-864 (1972). (Control of meat shrinkage during enzyme inactivation of meats for irradiation.)
90. QUALITATIVE AND QUANTITATIVE ASPECTS OF TRACE VOLATILE COMPONENTS IN IRRADIATED FOODS AND FOOD SUBSTANCES.
Charles Merritt, Jr., Radiation Res. Rev. Vol. 3 (4): 353-368 (1972).
91. CHEMICAL AND PHYSICAL CHANGES IN FOOD PACKAGING MATERIALS EXPOSED TO IONIZING RADIATION.
John J. Killoran. Radiation Res. Rev. Vol. 3 (4): 369-388 (1972).
92. THE NUTRITIONAL QUALITY OF IRRADIATED FOODS. N. Raica, Jr., J. Scott and W. Nielsen. Radiation Res. Rev., Vol. 3 (4): 447-457 (1972).
93. THE EFFECT OF GAMMA IRRADIATION AND HEATING ON THE PROTEOLYTIC ACTIVITY OF MEAT SAMPLES.
T. Losty, J. W. Roth, and G. W. Shults. J. Agr. Food Chem., Vol. 21 (2): 275-277 (1973).

RADAPPERTIZATION OF FOODS

94. RADIATION PRESERVATION OF FOOD: PAST, PRESENT AND FUTURE.
E. S. Josephson and E. Wierbicki. Activities Report, Vol. 25 (1): 48-59 (1973).
95. PROGRESS AND FUTURE TASKS IN FOOD IRRADIATION.
International Atomic Energy Agency (IAEA) Bulletin, Vol. 15 (1):
2-9 (1973).
96. STORING MEAT PRODUCTS (WITHOUT REFRIGERATION) FOR SEVERAL YEARS.
IAEA Bulletin, Vol. 15 (1): 18-22 (1973).
97. COMPARATIVE RESISTANCE OF NONSPOROGENIC BACTERIA TO LOW-TEMPERATURE
GAMMA IRRADIATION.
A. Anellis, D. Berkowitz and D. Kemper. Applied Microbiology, Vol. 25 (4):
517-523 (1973).
98. NEW ADVANCES IN IRRADIATED FOODS.
"Foods of Tomorrow" Spring 1973, pp. F3-F10; insert in Food Processing,
Vol. 34, No. 4, April 1973.

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